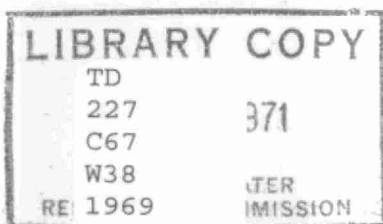


1969

**OPERATING
SUMMARY**

CORNWALL

**water pollution
control plant**



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ONTARIO WATER RESOURCES COMMISSION

Division of Plant Operations

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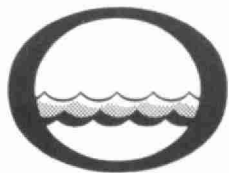
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Water management in Ontario

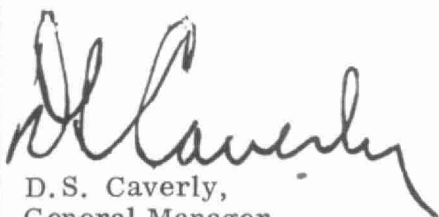
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Water Resources
Commission

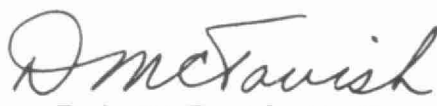
135 St. Clair Ave. W.
Toronto 195
Ontario

The operating efficiency and financial status of the water pollution control facilities operated for you in 1969 are presented in the following pages.

The regional operations engineer's comments and the statistical data will assist you in gauging the plant's level of performance. A new flow chart and up-to-date design data are also provided.

Various divisions and sections within the Commission have co-operated in providing what we trust is an accurate and concise annual operating summary.


D.S. Caverly,
General Manager.


D.A. McTavish, P. Eng.,
Director,
Division of Plant Operations.



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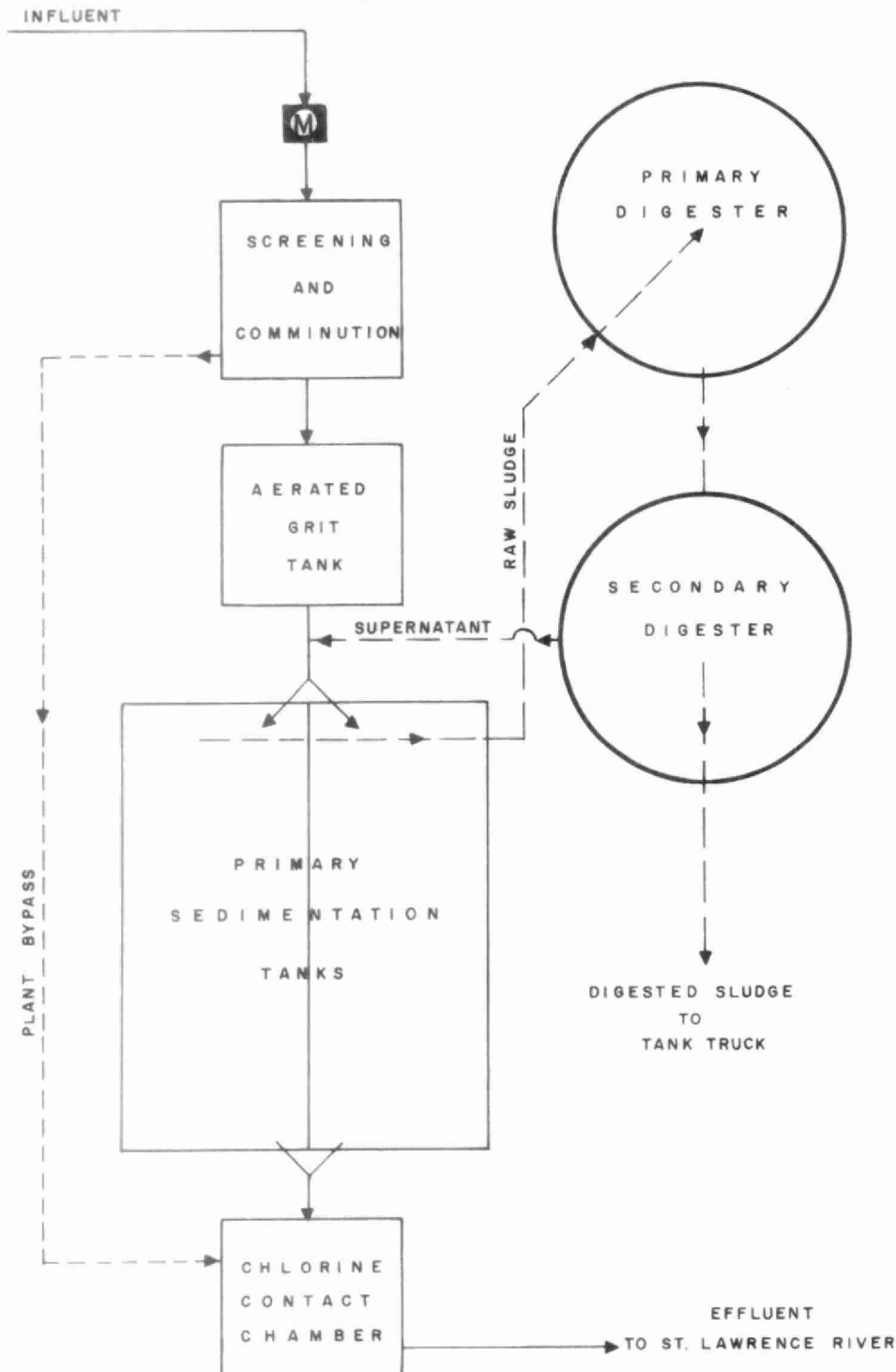
ST. LAWRENCE RIVER

WATER POLLUTION CONTROL CENTRE NO. 1

(CORNWALL)

1969 ANNUAL OPERATING SUMMARY

ST. LAWRENCE RIVER
WATER POLLUTION CONTROL CENTRE No.1
(CORNWALL)



DESIGN DATA

PROJECT NO. 1-0001-66

DESIGN FLOW

8.25 mgd

DESIGN POPULATION

66,000

PRIMARY TREATMENT

Comminution

Type: Barminutor
Size: Two Type "C"

Screening (Bypass channel)

Size: 2" spaces

Grit Removal

Type: Aerated; grit removed by
clamshell bucket
Size: Two 38' 6" x 15' 10" x 13' 5"
swd (98,500 gal)
Retention: 17 min

Air Supply

Type: Hoffman
Size: Two 1,100 scfm (also for channel
aeration)

Primary Sedimentation

Type: Jeffrey
Size: Two 143' x 48' x 12' (1.245
mil gal)
Retention: 3 hours
Loading: Surface, 600 gal/ft²/day
Weir, 14300 gal/ft/day

CHLORINATION

Chlorinator

Type: W & T
Size: One 2,000 lb/day with evaporator

Chlorine Contact Chamber

Size: One 48' 7" x 26' 11" x 10' 6"
(85,800 gal)
Retention: 15 min

OUTFALL

- to St. Lawrence River

SLUDGE HANDLING

Digestion System - Two-stage

Primary Digester -
Type: Perth (gas mixed) with fixed
concrete cover
Size: One 65' dia x 24' swd (82,500
cu ft or 0.515 mil gal)
Loading: 2.88 lb/cu ft/mo

Secondary Digester -
Size: One 65' dia x 24' swd (82,500
cu ft or 0.515 mil gal)
Total Loading: 1.44 lb/cu ft/mo

Disposal

- by tank truck

'69 REVIEW

GENERAL

The St. Lawrence Water Pollution Control Centre No. 1, based in Cornwall, consists of an 8.25 mgd primary treatment plant, a pumping station, and associated trunk sewers. The plant began treating sewage in January, 1969. The official plant opening was held on October 10, 1969.

The project is operated by eight permanent staff members. During 1969, two of the staff resigned and were replaced.

Operating problems during the year consisted mainly of normal problems related to plant start-up and certain equipment deficiencies at the plant. The 1.26 million BTU/hr. boiler installed was unable to provide the required heating capacity for the sludge digesters and the plant buildings. It was supplemented by the installation of a second boiler with a 2.16 million BTU/hr. capacity.

Problems with the sewage flow meter owing to excessive turbulence at the measuring flume were remedied by the installation of a stilling well beside the flume for flow depth measurement. Considerable effort was spent on correct calibration of the flow recorders and totalizers for the desired accuracy.

The digester sludge transfer pumps proved incapable of handling the type of sludge produced at the plant. One of the two centrifugal pumps has been replaced by a positive displacement pump.

The plastic shoes on the sludge collector would not remain seated properly and had to be replaced with conventional cast iron shoes. Difficulties have been experienced with the scum collecting equipment for the settling tanks. This problem has yet to be adequately resolved.

After consultations with the City of Cornwall and the Ontario Department of Health, the location for disposal of digested sludge from the plant was chosen as the disposal site for industrial waste. This was intended to be a temporary site until a more suitable one was found. It was not necessary to haul digested sludge until September.

Problems were experienced with the automatic operation of the sluice gate in the Brookdale Ave. storm flow diversion chamber. The control cabinet for the chamber was originally located out-of-doors, but it was found that the weather caused malfunctioning of the controls. A small brick structure around the cabinet eliminated this problem. Water levels within the diversion chamber were originally measured only by entering the chamber, which is more than three miles from the plant. The installation of a level recorder was planned so that the levels could be measured at the plant.

EXPENDITURE

The cost of operating the sewage works was \$111,646.51. This was below the 1969 budget figure of \$135,000.00, primarily because costs for payroll, repairs and maintenance, and sundry were lower than expected.

PLANT FLOWS

The plant was designed for an average daily flow of 8.25 mgd. The total flow to the plant was 2535.9 mil. gal. in 1969 resulting in an average daily flow of 6.9 mgd, 16.4% below the design value.

PLANT EFFICIENCY

The average reduction in the BOD and suspended solids of the raw sewage treated at the plant was 28% and 58% respectively. This degree of treatment is consistent with that anticipated from a primary plant.

SLUDGE DIGESTION and DISPOSAL

Because the treatment plant was only put into service in the early part of the year, digester gas production did not begin until July and it was not necessary to dispose of digested sludge until September. For the remaining months of the year, an average of 70,000 gallons was hauled by tank truck to the industrial waste disposal site. The average volatile solids concentration of the sludge was 38%, indicating that it was well digested. The average total solids concentration of the raw sludge was 7.4%, while that of the digested sludge was 12.5%. A 69 percent reduction was therefore achieved in the volume of sludge.

CONCLUSIONS

The first year of operation has resulted in the elimination of many of the operating problems associated with the start-up of the project. The efficiency of treatment of the sewage received was satisfactory.

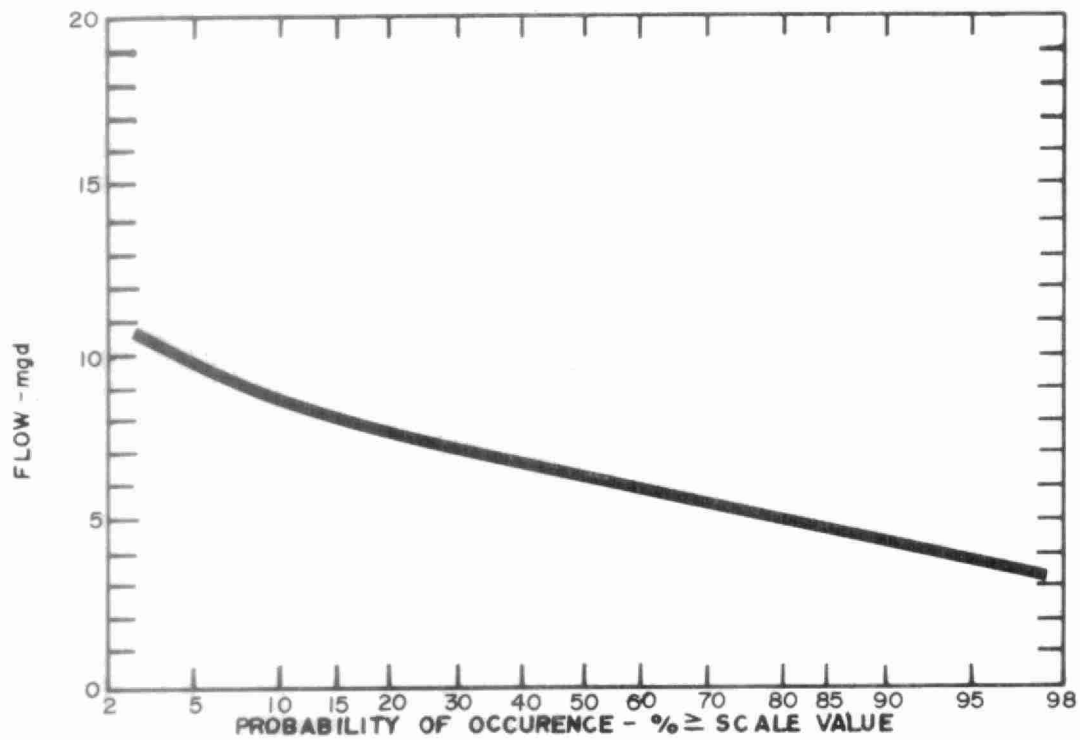
Monthly Operating Costs

MONTH	TOTAL EXPENDITURE	PAYROLL	CASUAL PAYROLL	FUEL	POWER	CHEMICALS	GENERAL SUPPLIES	EQUIPMENT	REPAIRS and MAINTENANCE	SUNDRY *	WATER	TRAVEL
JAN	10966.59	6162.00	-	-	-	-	56.04	4522.33	8.24	217.98	-	-
FEB	9137.42	3955.34	-	227.92	2272.35	-	250.29	2099.97	205.25	126.30	-	-
MAR	7934.18	4189.68	-	982.38	1605.90	-	534.75	19.79	74.22	527.46	-	-
APR	9030.13	4286.64	-	741.16	1898.40	810.60	524.07	377.10	191.24	200.92	-	-
MAY	2076.80	4261.15	-	406.42	1778.70	-	839.60	(5434.73)	49.22	176.44	-	-
JUNE	9340.50	4687.62	-	350.14	1736.40	1008.54	520.34	869.95	57.42	105.09	-	5.00
JULY	8359.43	4592.88	-	133.00	1956.00	228.65	548.85	125.65	470.97	184.25	-	119.15
AUG	11039.12	6650.40	-	112.00	1708.50	957.60	349.48	850.30	200.43	210.43	-	-
SEPT	9886.16	4370.91	574.09	220.66	1695.90	-	275.24	2148.19	362.77	337.40	-	-
OCT	11978.61	4577.04	254.84	-	1584.30	837.90	1240.25	1220.21	28.78	2235.29	-	-
NOV	9426.64	5447.89	106.76	-	1596.90	-	358.50	1010.72	135.71	588.38	-	181.78
DEC	12470.93	4078.34	-	290.48	1520.40	-	755.64	(83.14)	140.70	5526.12	-	232.39
TOTAL	111646.51	57259.89	836.69	3464.16	19353.75	3843.29	6252.95	7726.42	1924.95	10446.09	-	538.32

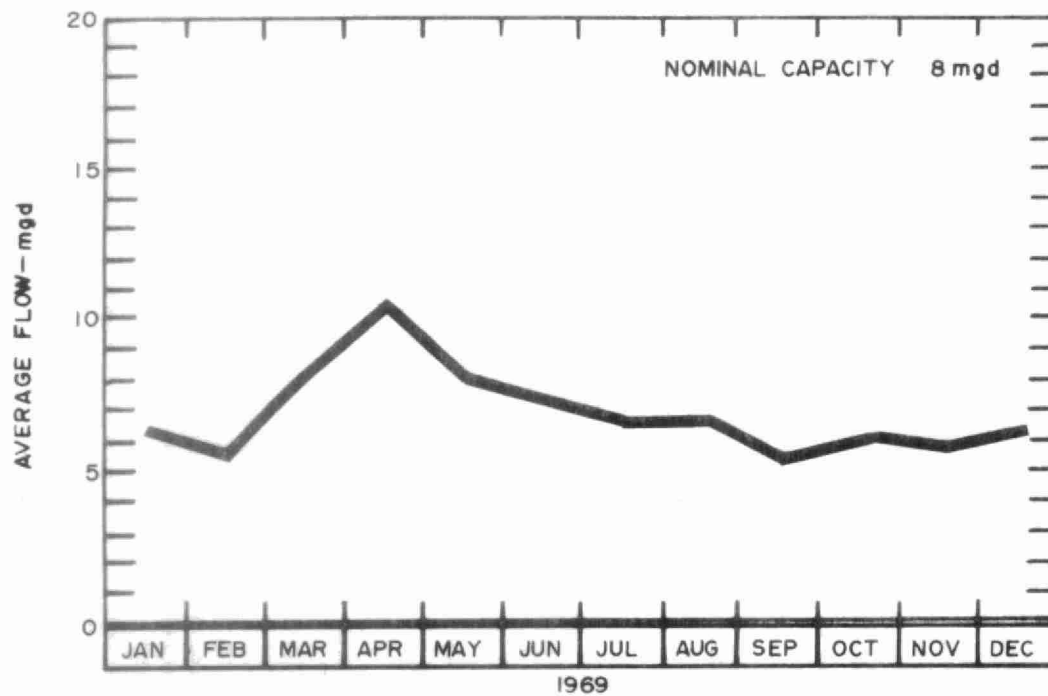
BRACKETS INDICATE CREDIT

* SUNDRY INCLUDES SLUDGE HAULAGE COSTS WHICH WERE \$2,683.00

PROCESS DATA



FL O W S

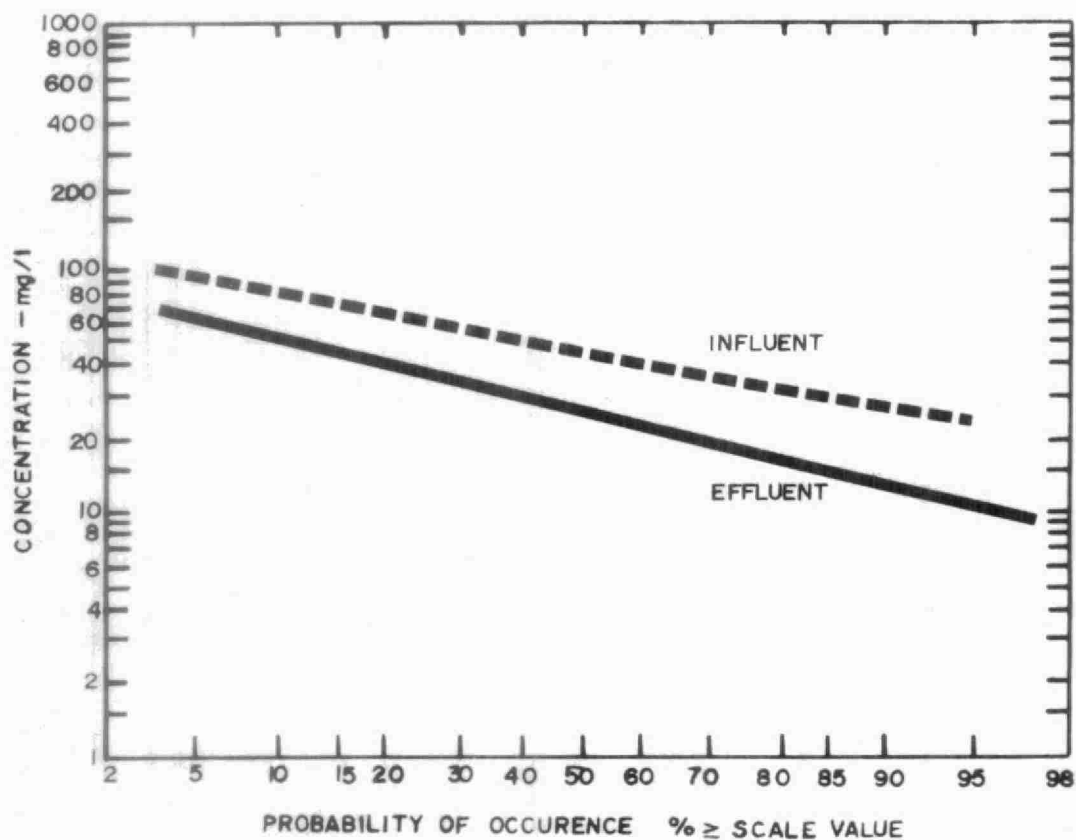


PLANT FLOWS and CHLORINATION

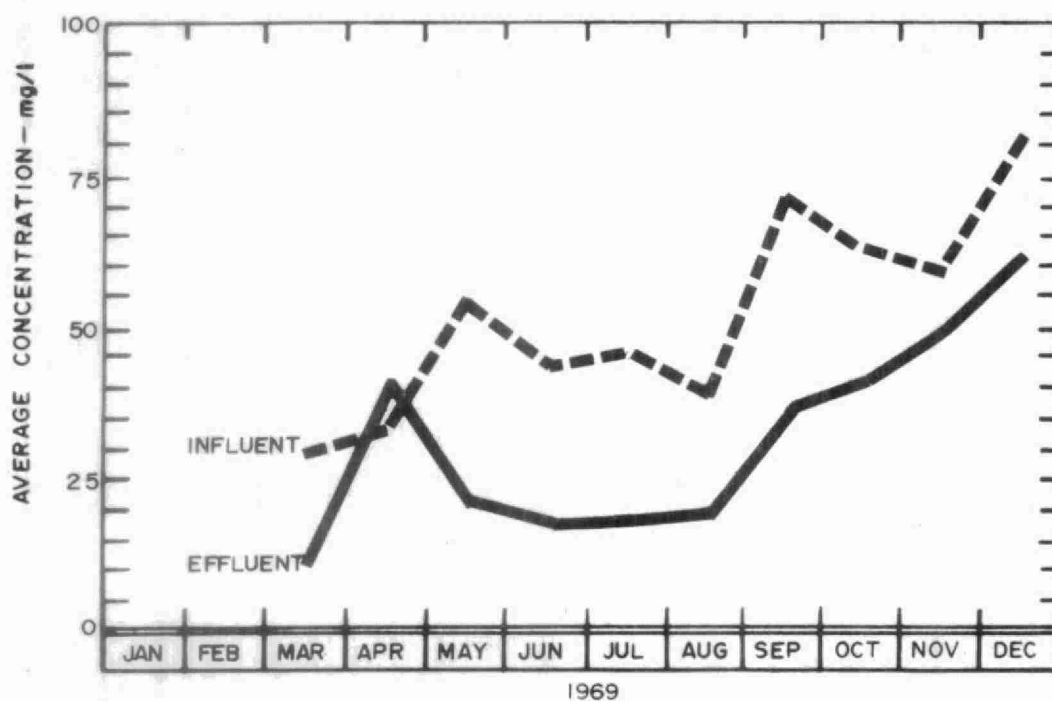
MONTH	TOTAL FLOW mil gal	AVERAGE DAILY FLOW mil gal	MAXIMUM DAILY FLOW mil gal	MINIMUM DAILY FLOW mil gal	CHLORINE USED 10 ³ pounds	DOSAGE mg/l
JAN	200.4	6.4	-	-	-	-
FEB	159.6	5.7	-	-	-	-
MAR	255.1	8.2	-	-	-	-
APR	314.4	10.5	-	-	0.3*	0.9
MAY	247.0	8.0	12.6	6.6	5.3	2.5
JUNE	216.5	7.2	14.8	4.6	5.1	2.3
JULY	208.2	6.7	9.8	5.4	7.4	3.5
AUG	214.0	6.9	17.6	5.2	8.0	3.7
SEPT	161.7	5.4	7.3	3.7	7.4	4.6
OCT	186.2	6.0	9.1	3.9	8.1	4.4
NOV	176.5	5.9	9.4	2.6	5.8	3.2
DEC	196.3	6.3	16.0	2.5	3.0**	3.3
TOTAL	2535.9	-	-	-	50.4	-
AVERAGE	-	6.9	-	-	7.2	3.4

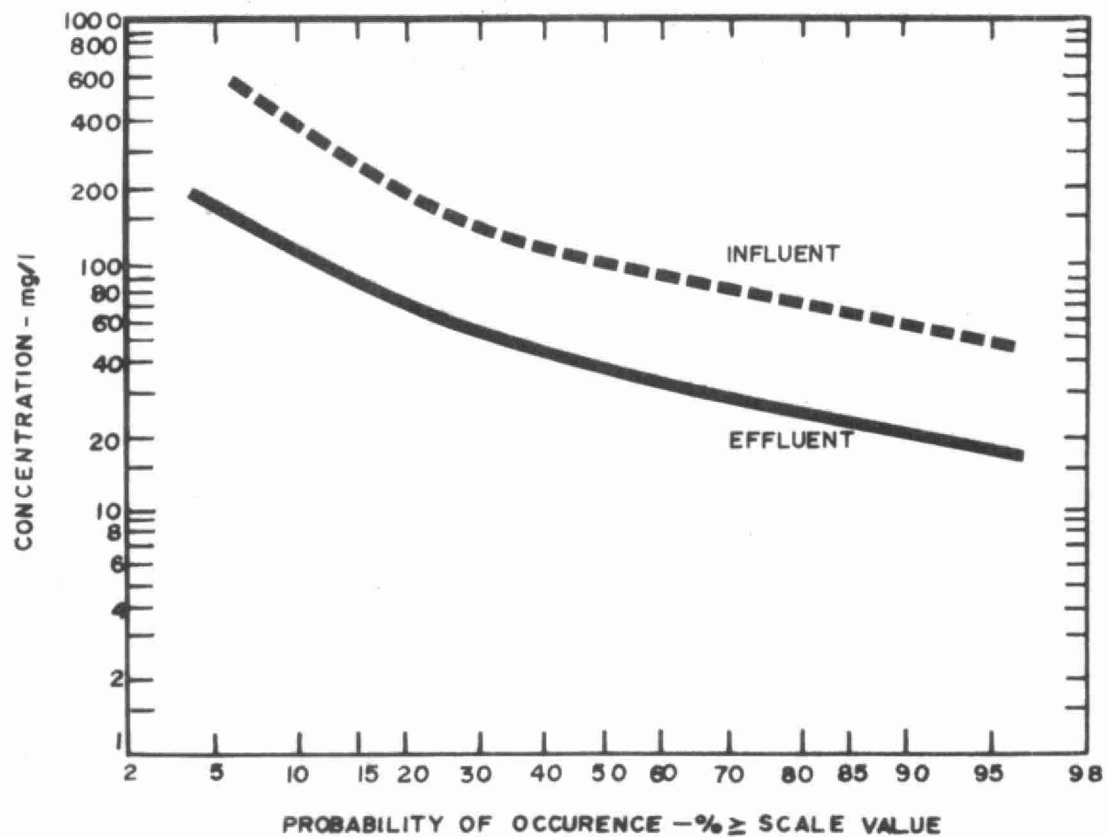
* 1 day chlorination

** 12 day chlorination

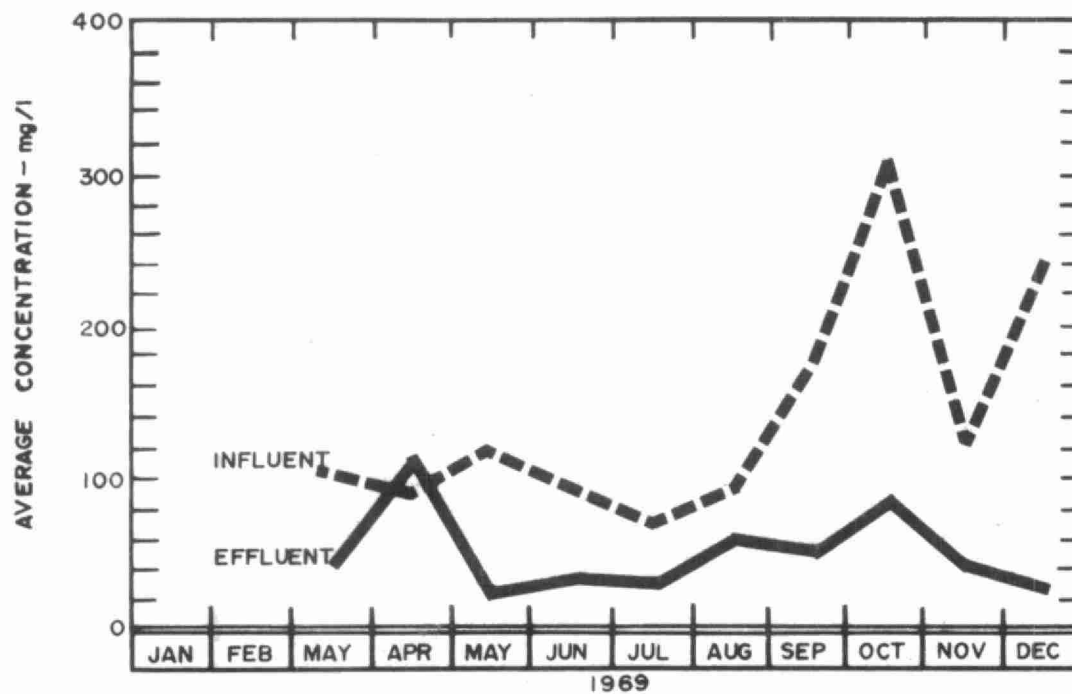


BIOCHEMICAL OXYGEN DEMAND



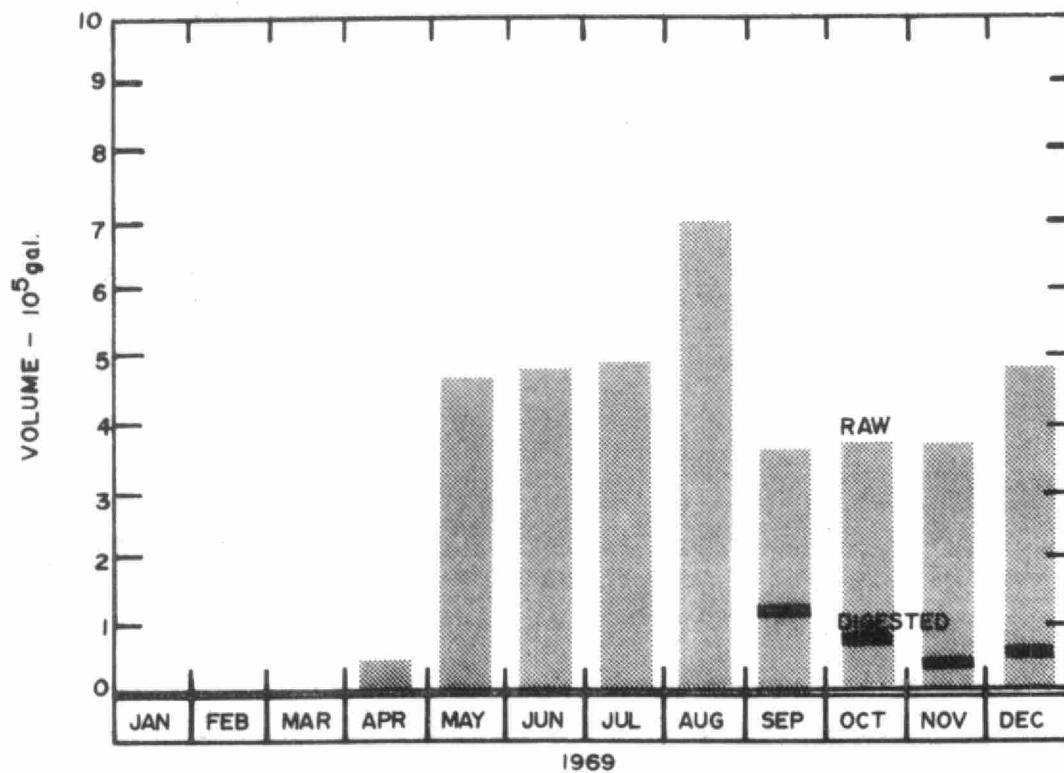


SUSPENDED SOLIDS

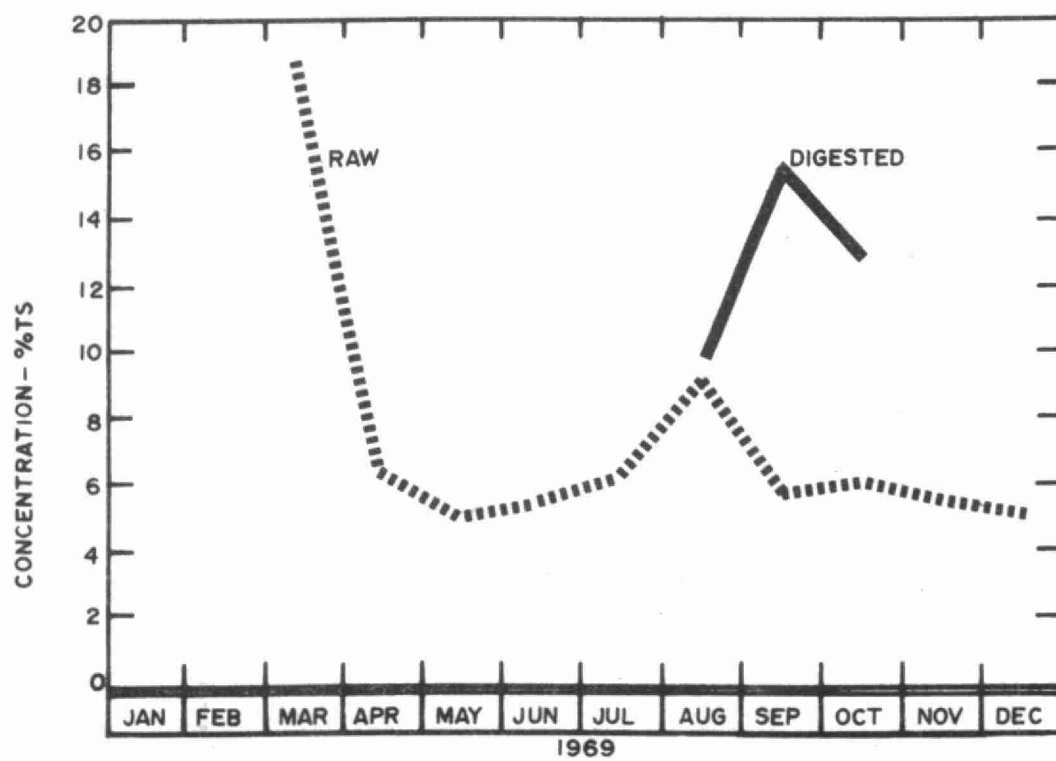


PLANT EFFICIENCY

MONTH	BIOCHEMICAL OXYGEN DEMAND				SUSPENDED SOLIDS				GRIT REMOVAL cu ft
	INF. mg/l	EFF. mg/l	REDUCTION		INF. CONCN mg/l	EFF. CONCN mg/l	REDUCTION		
			%	10 ⁵ pounds			%	10 ⁵ pounds	
JAN									
FEB									
MAR	30	12	60	.4	100	50	50	1.2	0
APR	33	41	0	0	90	122	0	0	0
MAY	55	22	60	.8	120	30	75	2.2	0
JUNE	44	18	59	.6	90	40	56	1.1	0
JULY	45	18	60	.6	70	40	43	0.6	0
AUG	39	20	49	.4	90	68	24	0.5	0
SEPT	72	36	50	.6	170	60	65	1.8	567
OCT	64	41	36	.5	305	90	70	4.0	0
NOV	60	50	17	.2	120	50	58	1.2	0
DEC	82	62	24	.4	240	37	84	4.0	0
TOTAL	-	-	-	4.5	-	-	-	16.6	567
AVERAGE	52	32	38	.5	140	59	58	1.8	-



DIGESTION



SLUDGE DIGESTION and DISPOSAL

MONTH	RAW SLUDGE			DIGESTED SLUDGE			SUPERNATANT		SLUDGE DISPOSAL	
	VOLUME	TOTAL SOLIDS	VOL SOLIDS	VOLUME	TOTAL SOLIDS	VOL SOLIDS	VOLUME	TOTAL SOLIDS	DEWATERED	LIQUID
	10 ⁵ gal	%	%	10 ⁵ gal	%	%	10 gal	%	cu yd	cu yd
JAN	-	-	-	0	-	-	-	-	-	0
FEB	-	-	-	0	-	-	-	-	-	0
MAR	-	18.7	-	0	-	-	-	0.6	-	0
APR	0.5*	6.2	56	0	-	-	-	0.6	-	0
MAY	4.7	5.2	65	0	-	-	-	0.7	-	0
JUNE	4.8	5.6	68	0	-	-	-	5.0	-	0
JULY	4.9	6.3	58	0	-	-	-	-	-	0
AUG	7.0	9.6	47	0	9.4	38	-	0.7	-	0
SEPT	3.6	5.9	62	1.2	15.6	34	-	0.4	-	744
OCT	3.7	6.0	57	.8	12.7	36	-	0.3	-	486
NOV	3.7	5.7	78	.4			-	0.2	-	252
DEC	4.7	5.2	65	.5		43	-	0.2	-	282
TOTAL	-	-	-	2.9		-	-	-	-	1764
AVERAGE	4.7	7.4	62	0.7	12.5	38	-	1.0	-	-

* 3 days'

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